A LINE ON LIFE

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To Prove a Point *

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In various advertisements, announcers claim to prove their product to be superior. In turn, when we hear the terms "*proven*" or "*proof,*" we tend to accept the claim as being **infallible** or **indisputable** — we uncritically accept what they say. In psychology, it's even more important to be critical of statements of "*proof*." Why? Hasn't it been proven?

Strictly speaking, proof only exists in formal systems like mathematics and logic. However, in the sciences, a theory or hypothesis cannot be proven. Then, of course, I cannot prove this to you. However, let me illustrate my point with an example.

Suppose I generate a sequence of three numbers according to a particular rule, but you do not know the rule. You need to find out what the rule is by generating your own sets of three numbers. I will then tell you if your set fits my rule. Suppose my sequence of three numbers is the set indicated below.

2, 4, 6

To find my rule, you need to generate various hypotheses or guesses as to what my rule might be and test them out with three-number sets of your own. Your first hypothesis for my rule is likely to be "*any set of three numbers that increases by 2*." To test this out, you try the set of numbers, "*8, 10, 12*." This fits my rule. Then you may try "*14, 16, 18,*" and again it fits my rule. Encouraged by this, you may try "*20, 22, 24,*" and find that it also fits. You may be so sure now that you assume your hypothesis is correct, but you have not established this.

To do this, you also have to *eliminate* other potential hypotheses. To test your hypothesis, you need to generate a set of numbers that do not fit my rule. In this case, you need to generate numbers that do not increase by 2. Suppose you give the numbers "*8, 14, 24,*" and it still fits my rule. At this point, you know that the numbers do not need to increase by 2. You have disproved your original hypothesis, but you still don't know my rule.

Possibly the numbers only have to be even numbers. To test this hypothesis, you try "*3, 5, 11,*" and find that this set also fits my rule. By trying numbers that do not fit your hypothesis and finding that they fit my rule, you have disproven another one of your hypotheses.

It could be that the numbers have to be either all odd or all even. To test this out, you generate another set that should not fit, because it has one odd and two even numbers — "*1, 6, 8*." They still fit my rule. Another hypothesis down the drain!

Swallowing your frustration, you need to establish another hypothesis. At this point, you know that the numbers can be odd or even. Also the size of the interval between the numbers does not seem to matter. It could be that the three numbers need only to be in an ascending series. To test this out, you generate another set of numbers that does not fit your hypothesis — "*33, 15, 4*." This set does not fit my rule.

At this point, you may think that you have discovered my rule — the set must consist of any three ascending numbers. You think you have proved your hypothesis. However, this is not true. As an example, let's try another set of numbers — "*15, 11, 4*." Guess what? This set fits my rule! Now what has happened to your hypothesis?

Many people attribute a greater degree of certainty to science than is really there.

In science, we can never say for certain what the rules are. Similarly, in psychology, we are never certain about the rules governing human behavior. However, when accurate evidence contradicts our hypothesis, we can be sure that this hypothesis is not true. Then we need to generate a new hypothesis to account for the available information. Once another hypothesis is generated, we need to test it out. To test it, we look for evidence that will disprove the hypothesis. In terms of human behavior, by demonstrating what is not the cause, we get progressively closer to knowing what is the cause.

Some of you may still be curious about my rule for the sets of numbers — *any three numbers are acceptable as long as **no** number exceeds 25*. Even if you guessed the rule, you still could not be absolutely certain you are right. You could never be sure that you have tested all the possible alternative rules. Then how do I know the rule? *It's **my** rule!*

The only way we can know the rules for certain is to be told the rules by whoever created them. Nobody knows the laws of nature, except for the creator of nature. So far, our creator has not given us the rules. However, after eliminating countless hypotheses, we have a good idea of some rules in some areas.

Finally, if you think I have "*proved my point,*" you really don't understand what I have been discussing in this article.

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* Adapted from Benjamin T. Ludy, Jr., J. Roy Hopkins, and Jack R. Nation's *Psychology,* Macmillan Publishing, 1987, page 13.